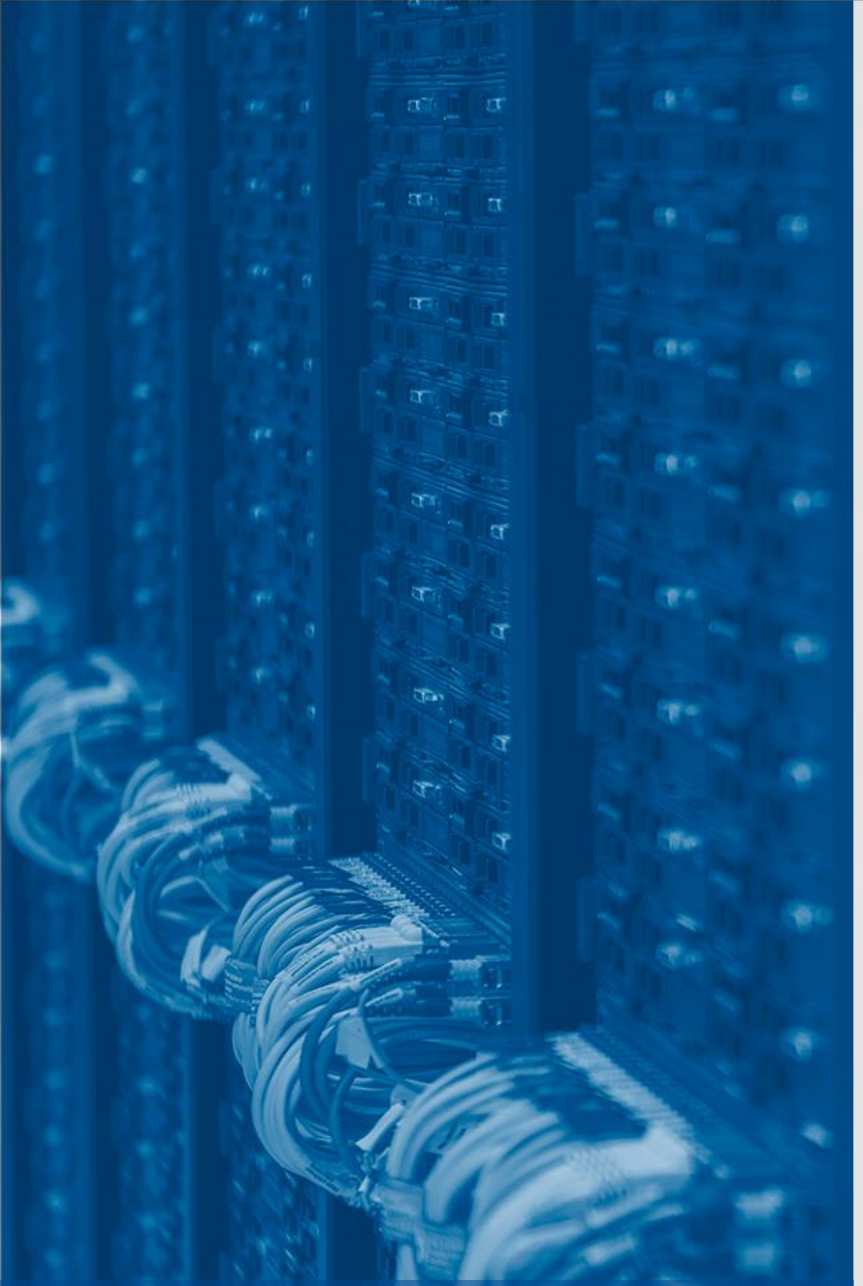

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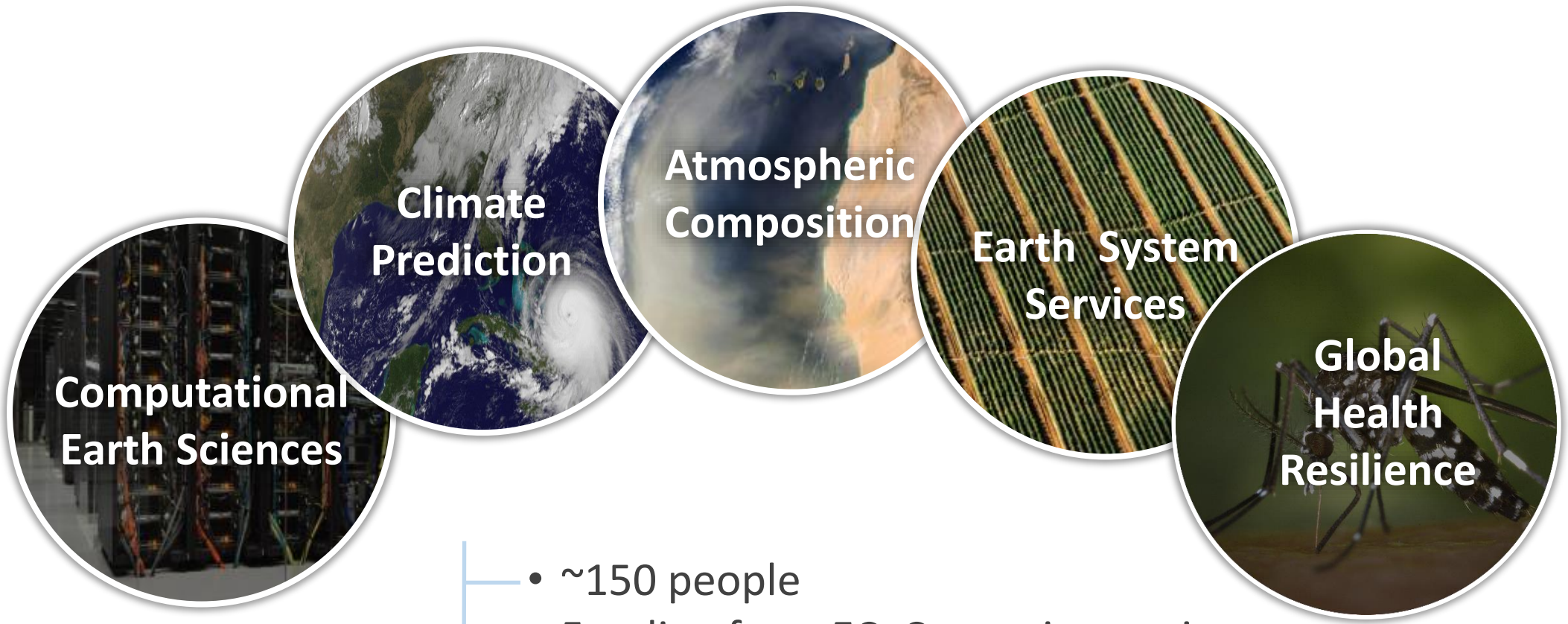
Earth Sciences Department

19 May 2023

ICREA

Earth Sciences Department

Environmental modelling and forecasting using process-based and artificial intelligence models, with a particular focus on weather, climate and air quality. This includes transferring solutions to support the main societal environmental challenges through data applications



- ~150 people
- Funding from EC, Copernicus, private sector, ESA, Spanish and regional governments
- Four ICREA, close link to local universities

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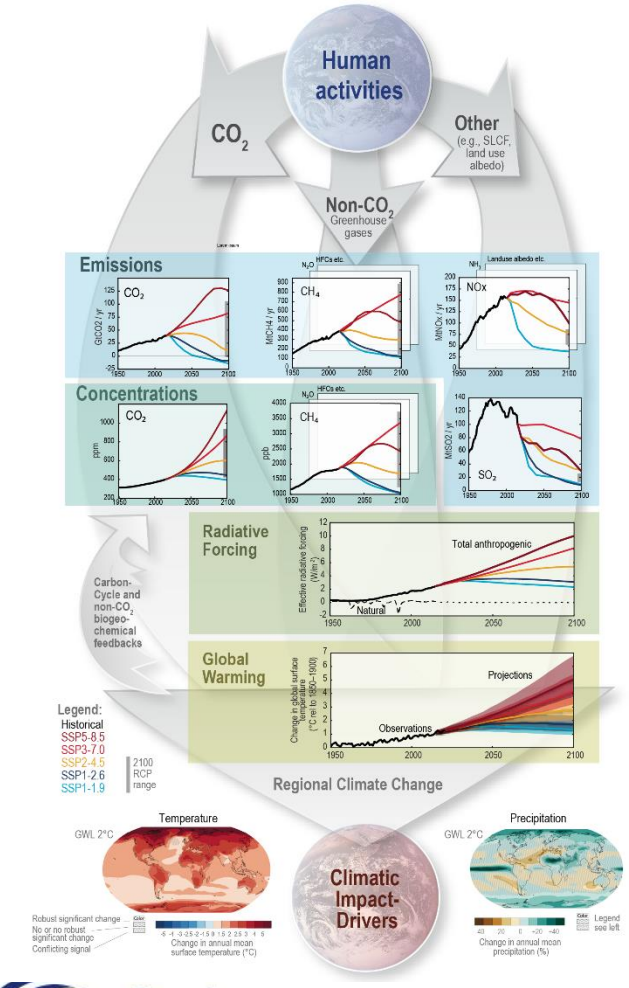
Climate modelling

Climate models are a fundamental tool to predict the future climate evolution.



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Polar2MidLat project

Marie-Skłodowska-Curie postdoctoral fellowship (Feb2023-Jan2025)

Objectives:

- Improve our understanding of the physical processes responsible for the interactions between the polar regions and midlatitudes, especially for cold air outbreaks
- Identify the effects of the rapid climate change within the Arctic on mid-latitudes (Europe, Asia, North America)
- Characterize the modulation of climate variability around Antarctica on the Southern Hemisphere climate
- Assess the potential future changes under the continued global warming conditions

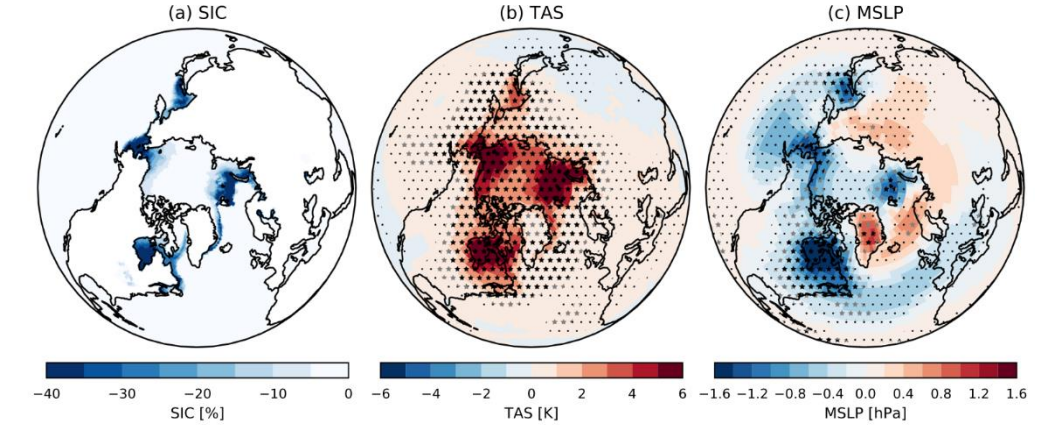
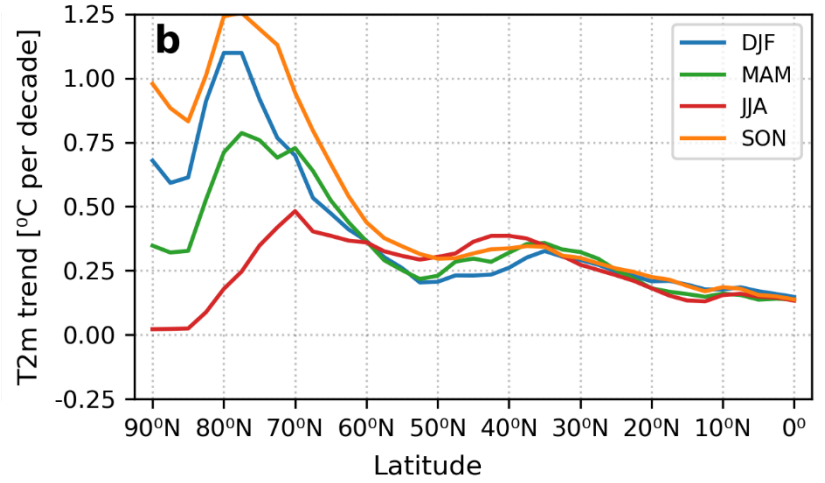


Fig. 1 Winter response to future Arctic sea ice loss. a Imposed winter sea ice concentration difference (%). **b** Near surface temperature (TAS) response (K). Note that surface temperature changes are imposed in regions of sea ice loss. **c** Mean sea level pressure (MSLP) response (hPa). All plots show the winter (December, January, February, DJF) mean, and responses are for the multi-model ensemble mean (calculated as the unweighted average of all ensemble members). Stippling indicates where the multi-model ensemble mean response is significant (95% confidence interval). Black (grey) stars indicate where 100% (90%) of the individual models agree on the sign of the response.



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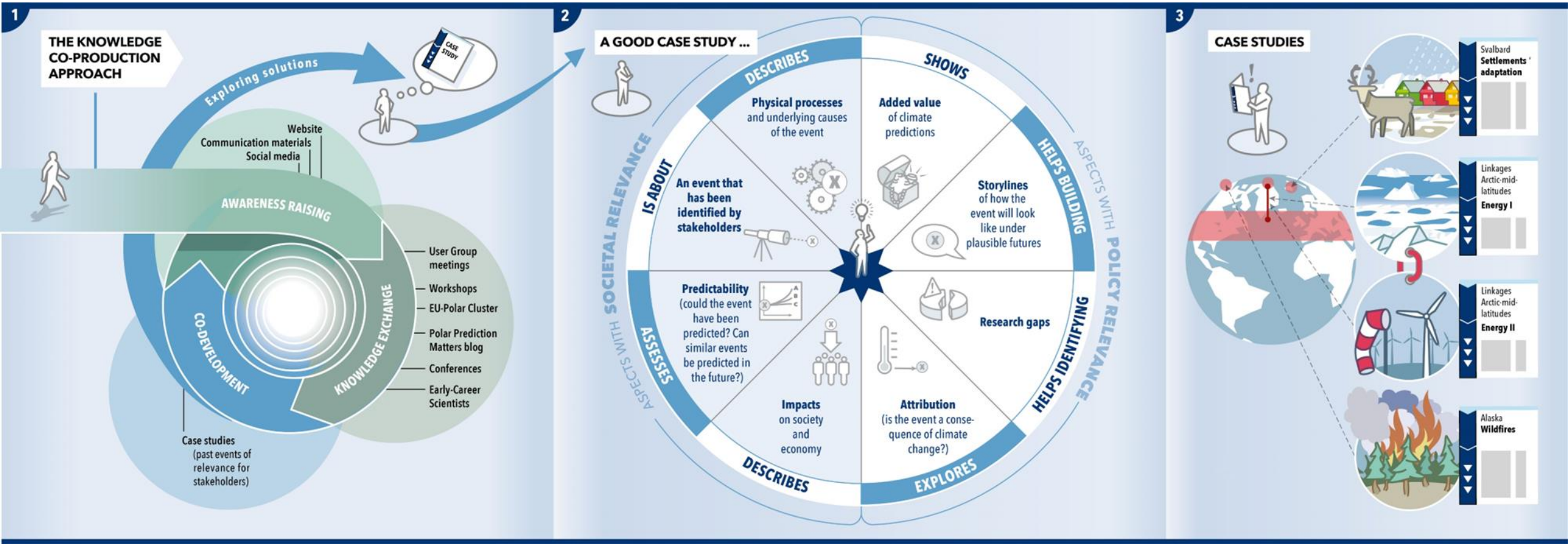
Knowledge co-development through climate-related case studies

APPLICATE.eu
Advanced prediction in polar regions and beyond



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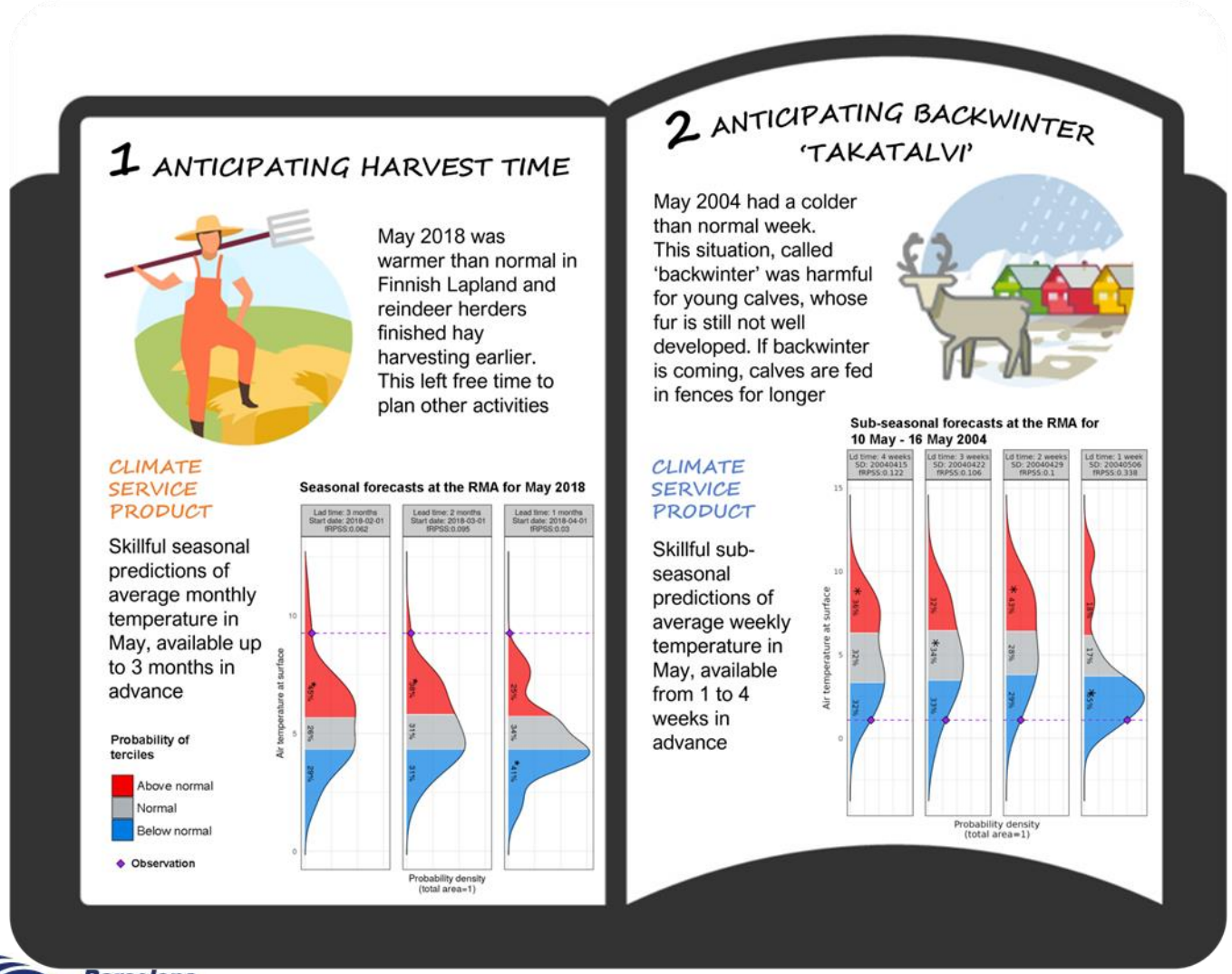
Terrado et al. (2023) **Good practice for knowledge co-development through climate related case studies**. https://doi.org/10.1016/j.crm.2023.100513

Co-producing climate services with reindeer herders in Finnish Lapland



- **Involvement of reindeer herders** from various cooperatives, one of them co-leading the project together with BSC
- Explore how **climate change adaptation stories** help assess the usability of climate predictions
- **Seasonal and sub-seasonal climate predictions** can help anticipate harvest time, backwinter and insect harassment, supporting herders' decision-making
- Co-produced climate services can enhance the **resilience of Polar regions**

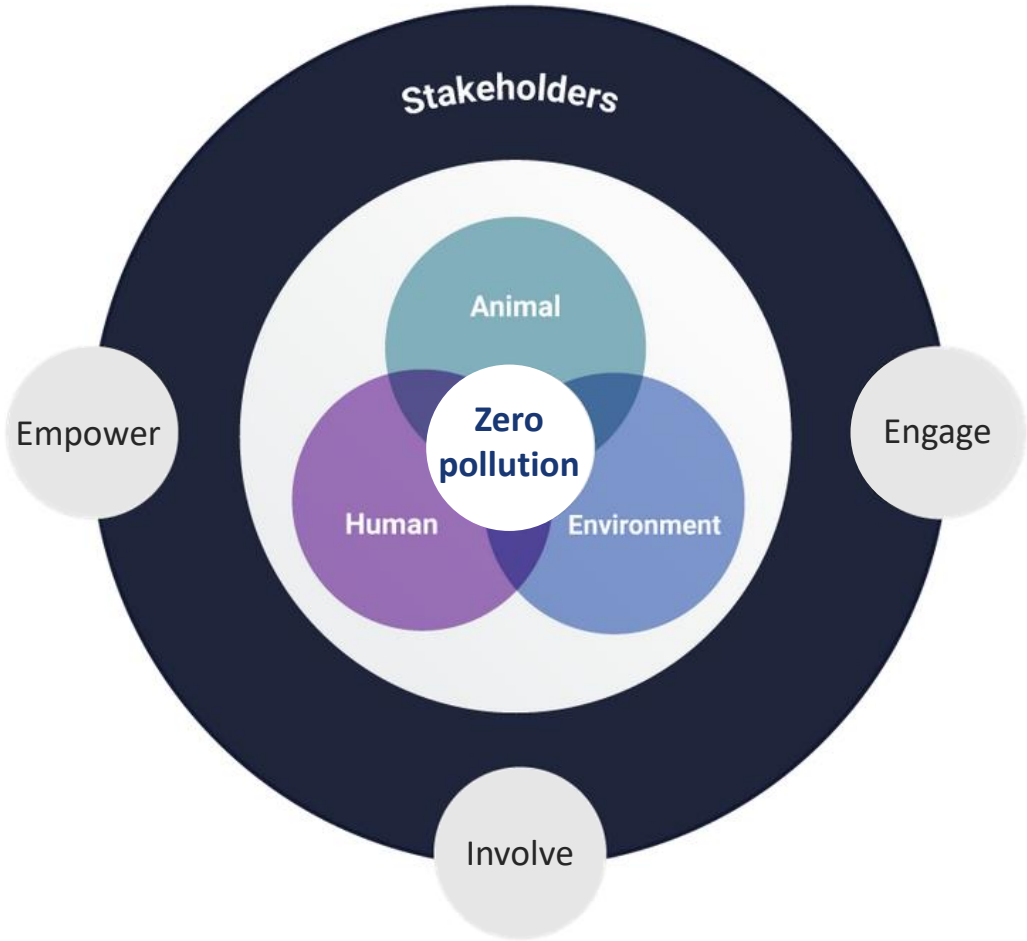
Terrado et al. **Climate change adaptation stories: co-exploring climate predictions with Arctic reindeer herders**. Submitted to Science of the Total Environment

This work has received funding from the EU-PolarNet 2 (grant agreement no. 101003766) service contracts

Proposal about ‘Innovative community engagement for building effective resilience and Arctic Ocean pollution-control governance in the context of climate change’

Objectives

- Assess pollution in combination with chronic climate-induced stressors on ecosystems and communities in the European Arctic’s land-ocean continuum using a OneHealth approach
- Develop strategies for enhancing community-led resilience and pollution-control governance
- Regional case studies:
  - Western Svalbard
  - Northern Greenland
  - Northern Iceland
- Multi-stakeholder and gender-based approaches t assess impacts, risks and vulnerabilities on Indigenous and local communities to co-create scenarios of change



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